

This listing of claims will replace all prior versions, listings, of claims in the application:

Listing of Claims:

1- 13. (cancelled)

14. (currently amended) A ~~diffraction-binding assay~~ method for detecting simultaneously at least two analytes[[,]] in a medium using light diffraction, comprising:

providing a substrate including a surface and on said the surface a first pre-selected pattern of a first analyte-specific receptor and at least a second pre-selected pattern ~~comprising~~ of a second analyte-specific receptor, wherein each said pre-selected pattern gives rise ~~corresponding~~ to a pre-selected diffraction pattern distinct from each all other diffraction patterns;

~~contacting said~~ the surface of the substrate with the medium for a sufficient time to permit pre-selected analytes present in ~~solution~~ the medium to bind ~~with~~ to their associated analyte-specific receptors; and

illuminating ~~said~~ the substrate and detecting, at a position spaced from the substrate surface, an image of light ~~diffracted light~~ from said the substrate surface and analysing ~~said~~ the image of diffracted light for presence of [[a]] one or more of the pre-selected diffraction image patterns representative of binding of one or more analytes ~~with~~ to their associated pre-selected pattern of analyte-specific receptors and identifying from ~~said~~ the ~~diffraction image of diffracted light~~ one or more analytes present in ~~said~~ the medium.

15. (currently amended) The method according to claim 14 wherein illuminating ~~said the~~ substrate includes illuminating a sufficient area of ~~said the~~ substrate to illuminate at least a part of each of ~~said at least two patterns~~ patterns present on the substrate.

16. (original) The method according to claim 14 wherein illuminating [said] the substrate includes illuminating the patterns one a time.

17. (currently amended) The method according to claim 15 wherein analysing ~~said the image of~~ diffracted light for the presence of [[a]] diffraction ~~image~~ patterns representative of binding of one or more analytes ~~with to~~ their analyte-specific receptors includes storing the ~~diffraction image~~ of diffracted light from ~~said the~~ illuminated area.

18. (currently amended) The method according to claim 15 including detecting ~~light~~ an image of diffracted light from [said] the substrate surface prior to exposure of ~~said the~~ substrate surface to ~~said the~~ medium for producing a baseline diffraction image due to said substrate and analyte-specific receptor patterns in the absence of analytes, including storing said baseline diffraction image.

19. (currently amended) The method according to claim 18 wherein analysing ~~said the image of~~ diffracted light for the presence of [[a]] diffraction ~~image~~ patterns representative of binding of one or more analytes with their analyte-specific receptors includes comparing ~~said diffraction~~ the image of diffracted light with ~~said the~~ baseline diffraction image.

20. (currently amended) The method according to claim 15 wherein ~~said light source is a laser that emits~~ illuminating the substrate includes illuminating with a substantially coherent, monochromatic laser beam.

21. (currently amended) The method according to claim 20 wherein [said] the laser beam emits light in the infrared, visible or ultraviolet.

22. (currently amended) The method according to claim 14 wherein [said] the substrate is substantially transparent and [said] the surface is illuminated from one side of [said] the substrate, and wherein [said light] the image of diffracted light from [said] the substrate is detected on the opposite side of [said] the substrate.

23. (currently amended) The method according to claim 14 wherein [said] the substrate is partially reflecting and [said] the surface is illuminated from one side thereof, and wherein the image of diffracted light is detected on the same side of [said] the substrate.

24. (currently amended) The method according to claim 14 wherein [said] the substrate is reflecting, and [said] the surface is illuminated from one side thereof, and wherein the image of diffracted light is detected on the same side of [said] the substrate.

25. (currently amended) The method according to claim 14 wherein, after contacting [said] the surface of the substrate with a medium being screened for preselected analytes, [said] the substrate is rinsed and dried prior to being illuminated.

26. (currently amended) The method according to claim 14 wherein contacting [said] the surface of the substrate with the medium includes placing [said] the

substrate in a cell containing [said] the medium being screened for analytes, said cell having at least one optical window for light to pass therethrough for detecting for analytes in [said] the medium in situ.

27. (currently amended) The method according to claim 26 wherein intensities of selected regions of the resulting [diffraction] image of diffracted light are monitored as a function of time.

28. (currently amended) The method according to claim 14 wherein the light illuminating [said] the substrate is directed toward [said] the substrate at an effective angle such that it undergoes total internal reflection from [the] a substrate/medium interface.

29. (currently amended) The method according to claim 14 wherein said analyte-specific receptors are one of a member of a binding pair selected from [the] a group consisting of antibody-antigen, enzyme-inhibitor, complementary strands of nucleic acids or oligonucleotides, receptor-hormone, receptor-effector, enzyme-substrate, enzyme-cofactor, glycoprotein-carbohydrate, binding protein-substrate, antibody-hapten, protein-ligand, protein-nucleic acid, protein-small molecule, protein-ion, cell-antibody to cell, small molecule-antibody to said small molecule, chelators to metal ions and air-born pathogens to associated air-born pathogen receptors.

30. (currently amended) The method according to claim 14 wherein [said] the substrate is selected from [the] a group consisting of glass, mica, polished silicon, silicon dioxide, polymeric materials, substantially transparent polymeric materials, partially or fully reflective substrates including metals, and metal coated substrates.

31. (currently amended) The method according to claim 14 including contacting [said] the surface of the substrate with a medium containing a

standard material that binds to the bound analytes after contacting [said] the surface of the substrate with the medium [being screened] and prior to illuminating [said] a selected area of [said] the surface.

32. (currently amended) The method according to claim 31 wherein said standard material is selected from [the] a group consisting of proteins, metal colloids, polymer colloids, colloidal silica, quantum dots, [or] and combinations thereof.

33. (currently amended) The method according to claim 14 wherein the medium is selected from [the] a group consisting of blood, serum, plasma, and urine.

34 – 65 (cancelled)

66. (new) The method according to claim 18 wherein the step of analyzing the image of diffracted light includes analysing for differences in intensity between the image of diffracted light and the baseline diffraction image.